Serial No. 10/659,805
Docket ITW 0006 IA/41038.9/14350

IN THE CLAIMS

The following listing of claims will replace all prior versions, and listings, of claims in the present application:

1. (Currently Amended) A two-part epoxy adhesive comprising:

a) a resin component comprising a mixture of epoxy resin, a plasticizer/accelerator, and an internally flexibilized epoxy resin, and

b) a hardener component comprising a mixture of a flexibilizer and an unmodified or modified aliphatic amine, an unmodified or modified polyamide, or combinations thereof,

wherein after said resin component and said hardener component are mixed and reacted the cured epoxy adhesive has a tensile elongation at room temperature of greater than 30%.

2. (Original) The two-part epoxy adhesive of claim 1 wherein the epoxy adhesive has an initial curing time of less than 3 hours.

3. (Currently Amended) The two-part epoxy adhesive of claim 1 wherein said resin component further includes ~~a plasticizer/accelerator,~~ a coupling agent, fillers, and a thixotropic agent.

4. (Original) The two-part epoxy adhesive of claim 1 wherein said hardener component further includes plasticizer/accelerator, an accelerator and a thixotropic agent.

5. (Original) The two-part epoxy adhesive of claim 1 wherein said resin component comprises by weight:

30-75% epoxy resin,

5-40% internally flexibilized epoxy resin,

5-40% plasticizer/accelerator,

0.1-1% coupling agent,
11-45% filler, and
1-8 % thixotrophic agent.

6. (Original) The two-part epoxy adhesive of claim 5 wherein said epoxy resin is a Bisphenol A epoxy resin, said internally flexibilized epoxy resin is an internally flexibilized Bisphenol A type epoxy resin, said plasticizer/accelerator is a phenol based plasticizer/accelerator, said coupling agent is an epoxide functional silane base coupling agent, and said filler is a mixture of limestone filler and white pigment.

7. (Original) The two-part epoxy adhesive of claim 1 wherein said hardener component comprises by weight:

20-80% flexibilizer,
5-30% unmodified aliphatic amine,
1-10% accelerator,
10-50% modified aliphatic amine,
0-15% unmodified or modified polyamide, and
1-8% thixotropic agent.

8. (Original) The two-part epoxy adhesive of claim 7 wherein said flexibilizer is an amine terminated butadiene acrylonitrile adduct, said unmodified aliphatic amine is an unmodified glycol ether base aliphatic amine, said accelerator is a tertiary amine accelerator, and said modified aliphatic amine is an AEP base modified amine.

9. (Previously presented) The two-part epoxy adhesive of claim 1 wherein said resin component is free of nonylphenol and said hardener component is free of nonylphenol.

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10. (Original) The two-part epoxy adhesive of claim 9 wherein said resin component further includes a plasticizer/accelerator free of nonylphenol, a coupling agent, fillers, and a thixotropic agent.

11. (Original) The two -part epoxy adhesive of claim 10 wherein said plasticizer/accelerator free of nonylphenol is dinonylphenol.

12. (Original) The two -part epoxy adhesive of claim 9 wherein said hardener component further includes plasticizer/accelerator free of nonylphenol, an accelerator, and a thixotropic agent.

13. (Original) The two -part epoxy adhesive of claim 12 wherein said plasticizer/accelerator free of nonylphenol is dinonylphenol.

14. (Original) The two -part epoxy adhesive of claim 9 wherein said resin component comprises by weight:

30-75% epoxy resin,
5-40% internally flexibilized epoxy resin,
5-40% plasticizer/accelerator free of nonylphenol,
0.1-1% coupling agent,
11-45% filler, and
1-8 % thixotropic agent.

15. (Original) The two -part epoxy adhesive of claim 14 wherein said plasticizer/accelerator free of nonylphenol is dinonylphenol.

16. (Original) The two -part epoxy adhesive of claim 14 wherein said epoxy resin is a Bisphenol A epoxy resin, said internally flexibilized epoxy resin is an internally flexibilized Bisphenol A type epoxy resin, said coupling agent is an epoxide functional silane base coupling agent, and said filler is a mixture of limestone filler and white pigment.

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17. (Original) The two -part epoxy adhesive of claim 9 wherein said hardener component comprises by weight:

30-80% flexibilizer,

8-45% unmodified aliphatic amine,

0-15% modified aliphatic amine,

0-15% unmodified or modified polyamide,

1-10% accelerator,

5-20% plasticizer/accelerator free of nonylphenol, and

1-8% thixotropic agent.

18. (Original) The two -part epoxy adhesive of claim 17 wherein said plasticizer/accelerator free of nonylphenol is dinonylphenol.

19. (Original) The two -part epoxy adhesive of claim 17 wherein said flexibilizer is an amine terminated butadiene acrylonitrile adduct, said unmodified aliphatic amine is a mixture of an unmodified glycol ether base aliphatic amine and unmodified AEP base aliphatic amine, and said accelerator is a tertiary amine accelerator.

20. (Original) The two -part epoxy adhesive of claim 1 wherein the reactive mixture of said resin component and said hardener component has an initial curing time of about 1.5-2 hours and after curing the epoxy adhesive has a tensile elongation at room temperature of greater than 120%.

21. (Original) The two -part epoxy adhesive of claim 20 comprising:

a) a resin component comprising a mixture of:

40-45% Bisphenol A epoxy resin,

8-15% internally flexibilized Bisphenol A type epoxy resin,

10-20% phenol base plasticizer/accelerator,

0.3-0.6% epoxide functional silane base coupling agent,

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15-25% limestone filler,

0.5-2% white pigment, and

4-6% thixotrophic agent, and

b) a hardener component comprising a mixture of:

40-45% amine terminated butadiene acrylonitrile adduct,

7-15% unmodified glycol ether base aliphatic amine,

5-8% tertiary amine accelerator,

25-40% AEP base modified amine, and

1-8% thixotrophic agent.

22. (Original) The two-part epoxy adhesive of claim 9 wherein the reactive mixture of said resin component and said hardener component has an initial curing time of about 1.5-2 hours and after curing the epoxy adhesive has a tensile elongation at room temperature of greater than 80%.

23. (Original) The two-part epoxy adhesive of claim 22 comprising:

a) the resin component free of nonylphenol comprising a mixture of:

45-55% Bisphenol A epoxy resin,

8-15% internally flexibilized Bisphenol A type epoxy resin,

10-20% dinonylphenol plasticizer/accelerator,

0.3-0.6% epoxide functional silane base coupling agent,

15-25% limestone filler,

0.5-2% white pigment, and

4-6% thixotropic agent, and

b) the hardener component free of nonylphenol comprising a mixture of:

55-65% amine terminated butadiene acrylonitrile adduct,

7-15% unmodified glycol ether base aliphatic amine,

5-8% unmodified AEP base aliphatic amine,

5-8% tertiary amine accelerator,

8-15% dinonylphenol plasticizer/accelerator, and

4-6% thixotropic agent.

24. (Currently Amended) The process of adhering at least two substrate surfaces to each other comprising:

intercalating between said surfaces an adhesive comprising a reactive mixture of:

a) a resin component comprising a mixture of epoxy resin, a plasticizer/accelerator, and internally flexible epoxy resin, and

b) a hardener component comprising a mixture of a flexibilizer and an unmodified or modified aliphatic amine, an unmodified or modified polyamide, or combinations thereof,

and allowing said adhesive to cure, whereby said cured adhesive has a tensile elongation at room temperature of greater than 30%.

25. (Original) The process of claim 24 wherein in said curing it takes less than 3 hours for initial curing.

26. (Original) The proc ess of claim 24 wherein said act of intercalating includes dispensing said resin component and hardener component in equal parts by volume and mixing until the mixture is relatively homogeneous and is applied relatively evenly to the substrates.

27. (Currently Amended) The process of claim 24 wherein said resin component further includes ~~a plasticizer/accelerator,~~ a coupling agent, fillers, and a thixotropic agent.

28. (Original) The proc ess of claim 24 wherein said hardener component further includes a plasticizer/accelerator, an accelerator, and a thixotropic agent.

29. (Original) The process of claim 24 wherein said resin component comprises by weight:

30-75% epoxy resin,

5-40% internally flexibilized epoxy resin,

5-40% plasticizer/accelerator,

0.1-1% coupling agent,

11-45% filler, and

1-8 % thixotrophic agent.

30. (Original) The proc ess of claim 29 wherein said epoxy resin is a Bisphenol A epoxy resin, said internally flexibilized epoxy resin is an internally flexibilized Bisphenol A type epoxy resin, said plasticizer/accelerator is a phenol based plasticizer/accelerator, said coupling agent is an epoxide functional silane base coupling agent, and said filler is a mixture of limestone filler and white pigment.

31. (Original) The proc ess of claim 24 wherein said hardener component comprises by weight:

20-80% flexibilizer,

5-30% unmodified aliphatic amine,

1-10% accelerator,

10-50% modified aliphatic amine, and

1-8% thixotropic agent.

32. (Original) The proc ess of claim 31 wherein said flexibilizer is an amine terminated butadiene acrylonitrile adduct, said unmodified aliphatic amine is an unmodified glycol ether base aliphatic amine, said accelerator is a tertiary amine accelerator, and said modified aliphatic amine is an AEP base modified amine.

33. (Original) The proc ess of claim 24 wherein:

a) said resin component comprises a mixture of:

40-45% Bisphenol A epoxy resin,

8-15% internally flexibilized Bisphenol A type epoxy resin,

10-20% phenol base plasticizer/accelerator,

0.3-0.6% epoxide functional silane base coupling agent,
15-25% limestone filler,
0.5-2% white pigment, and
4-6% thixotrophic agent, and

b) said hardener component comprises a mixture of:
40-45% amine terminated butadiene acrylonitrile adduct,
7-15% unmodified glycol ether base aliphatic amine,
5-8% tertiary amine accelerator,
25-40% AEP base modified amine, and
1-8% thixotrophic agent.

34. (Original) The proc ess of claim 24 wherein said resin component is free of nonylphenol, and said hardener component is free of nonylphenol.

35. (Original) The proc ess of claim 34 wherein said resin component free of nonylphenol further includes a plasticizer/accelerator free of nonylphenol, a coupling agent, fillers, and a thixotropic agent.

36. (Original) The proc ess of claim 35 wherein said plasticizer/accelerator free of nonylphenol is dinonylphenol.

37. (Original) The proc ess of claim 34 wherein said hardener component free of nonylphenol further includes a plasticizer/accelerator free of nonylphenol, an accelerator and a thixotropic agent.

38. (Original) The proc ess of claim 37 wherein said plasticizer/accelerator free of nonylphenol is dinonylphenol.

39. (Original) The proc ess of claim 34 wherein said resin component free of nonylphenol comprises by weight:

30-75% epoxy resin,

5-40% internally flexibilized epoxy resin,

5-40% dinonylphenol plasticizer/accelerator,

0.1-1% coupling agent,

11-45% filler, and

1-8 % thixotropic agent.

40. (Original) The process of claim 39 wherein said epoxy resin is a Bisphenol A epoxy resin, said internally flexibilized epoxy resin is an internally flexibilized Bisphenol A type epoxy resin, said coupling agent is an epoxide functional silane base coupling agent, and said filler is a mixture of limestone filler and white pigment.

41. (Original) The process of claim 34 wherein said hardener component free of nonylphenol comprises by weight:

30-80% flexibilizer,

8-45% unmodified aliphatic amine,

0-15% modified aliphatic amine,

0-15% unmodified or modified polyamide,

1-10% accelerator,

5-10% dinonylphenol plasticizer/accelerator, and

1-8% thixotropic agent.

42. (Original) The process of claim 41 wherein said flexibilizer is an amine terminated butadiene acrylonitrile adduct, said unmodified aliphatic amine is a mixture of an unmodified glycol ether base aliphatic amine and an unmodified AEP aliphatic amine, and said accelerator is a tertiary amine accelerator.

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43. (Original) The proc ess of claim 34 wherein:

a) said resin component free of nonylphenol comprises a mixture of:
45-55% Bisphenol A epoxy resin,
8-15% internally flexibilized Bisphenol A type epoxy resin,
10-20% dinonylphenol plasticizer/accelerator,
0.3-0.6% epoxide functional silane base coupling agent,
15-25% limestone filler,
0.5-2% white pigment and
4-6% thixotropic agent, and

b) said hardener component free of nonylphenol comprises a mixture of:
55-65% amine terminated butadiene acrylonitrile adduct,
7-15% unmodified glycol ether base aliphatic amine,
5-8% unmodified AEP aliphatic amine,
5-8% tertiary amine accelerator,
8-15% dinonylphenol plasticizer/accelerator, and
4-6% thixotropic agent.

44. (Original) A process for making a two-part epoxy adhesive comprising:

preparing a resin component by mixing an epoxy resin, an internally flexibilized epoxy resin, a plasticizer/accelerator, a coupling agent, fillers, and a thixotropic agent, and

preparing a hardener component comprising a mixture of a flexibilizer, an unmodified or modified aliphatic amine, or unmodified or modified polyamide, or combinations thereof, a plasticizer/accelerator, an accelerator, and a thixotropic agent.

45. (Original) The proc ess of claim 44 wherein said resin component is free of nonylphenol, and said hardener component is free of nonylphenol.

46. (Original) The proc ess of claim 45 wherein the plasticizer/accelerator is dinonylphenol.

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47. (Previously presented) The two-part epoxy adhesive of claim 1 wherein the internally flexibilized epoxy resin is selected from internally flexibilized bisphenol A type epoxy resins and internally flexibilized bisphenol F type epoxy resins.

48. (Previously presented) The two-part epoxy adhesive of claim 1 wherein the internally flexibilized epoxy resin is a butylated bisphenol A epoxy resin.

49. (Previously presented) The two-part epoxy adhesive of claim 1 wherein the flexibilizer is selected from butadiene acrylonitrile flexibilizers.

50. (Previously presented) The two-part epoxy adhesive of claim 1 wherein the flexibilizer is selected from amine terminated butadiene acrylonitrile flexibilizers.

51. (Previously presented) The process of claim 24 wherein the internally flexibilized epoxy resin is selected from internally flexibilized bisphenol A type epoxy resins and internally flexibilized bisphenol F type epoxy resins.

52. (Previously presented) The process of claim 24 wherein the internally flexibilized epoxy resin is a butylated bisphenol A epoxy resin.

53. (Previously presented) The process of claim 24 wherein the flexibilizer is selected from butadiene acrylonitrile flexibilizers.

54. (Previously presented) The process of claim 24 wherein the flexibilizer is selected from amine terminated butadiene acrylonitrile flexibilizers.

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